

## CLAIMS

What is claimed is:

1. A method for correcting pitch allocation in a cochlear implant system comprising:
  - generating a reference signal;
  - applying the reference signal to an appropriate electrode of the cochlear implant system;
  - generating a probe signal having a fixed interval relationship with the reference signal;
  - applying the probe signal to an appropriate electrode of the cochlear implant system;
  - shifting the location where the probe signal or reference signal is applied until the two signals match; and
  - using the location at which the probe signal is applied and the location at which the reference signal is applied when the two signals match to generate a frequency map, said frequency map being usable by the cochlear implant system to thereafter apply stimulus signals to correct locations within the cochlea as a function of pitch.
2. The method of Claim 1 further including generating additional reference signals and probe signals and determining the respective locations at which the probe signal and reference signals match to augment the frequency map.
3. The method of Claim 1 further including adjusting the stimulation parameters of the reference and probe signals in order to obtain a best possible match between the two signals, wherein the stimulation parameters include pulse amplitude and pulse width.

4. The method of Claim 1 wherein shifting the location where the probe signal or reference signal is applied comprises using current steering.

5. The method of Claim 4 wherein using current steering comprises using current steering to shift the location of the probe signal while maintaining the location of the reference signal constant.

6. The method of Claim 4 wherein using current steering comprises using current steering to shift the location of the reference signal while maintaining the location of the probe signal constant.

7. The method of Claim 4 wherein generating a probe signal having a fixed interval relationship with the reference signal comprises generating the probe signal to have an octave relationship with the reference signal.

8. The method of Claim 4 wherein generating a probe signal having a fixed interval relationship with the reference signal comprises generating the probe signal to have a frequency that has a musical scale relationship with the reference signal.

9. The method of Claim 4 wherein generating a reference signal comprises generating a reference signal selected from the group of signals that comprise a diatonic scale.

10. The method of Claim 4 wherein generating a probe signal having a fixed interval relationship with the reference signal comprises generating the probe signal to have a known speech sound relationship with the reference signal.

11. The method of Claim 10 wherein the probe signal comprises a fundamental vowel formant sound,  $F_0$ , and the reference signal comprises a  $F_1$  formant sound of the  $F_0$  formant.
12. The method of Claim 10 wherein the probe signal comprises a part of a known consonant sound, and the reference signal comprises a part of the same known consonant sound.
13. In a neurostimulation system, a method for correcting frequency allocation comprising
  - controlling the location where a stimulus is applied; and
  - controlling the temporal waveform structure of the stimulus that is applied.
14. The method of Claim 13 wherein controlling the location where a stimulus is applied comprises shifting the location where the stimulus is applied until a desired criteria is achieved.
15. The method of Claim 14 further including applying a reference stimulus and a probe stimulus, and wherein a fixed interval relationship exists between the reference signal and the probe stimulus; and wherein the desired criteria comprises achieving a match between the reference signal and the probe signal.
16. The method of Claim 15 wherein the fixed interval relationship between the reference signal and the probe signal comprises an octave relationship wherein the probe signal is one octave above or below the reference signal.

17. The method of Claim 15 wherein the fixed interval relationship between the reference signal and the probe signal comprises a known speech sound relationship.

18. The method of Claim 17 wherein the fixed interval relationship between the reference signal and the probe signal comprises a vowel formant relationship.

19. The method of Claim 17 wherein the fixed interval relationship between the reference signal and the probe signal comprises a consonant sound relationship.

20. The method of Claim 17 wherein the fixed interval relationship between the reference signal and the probe signal comprises a predefined tonal sequence.

21. A cochlear implant system comprising

- an implantable pulse generator;
- an electrode array having a multiplicity of electrodes connected to the implantable pulse generator;
- means for generating a reference signal;
- means for applying the reference signal to an appropriate electrode on the electrode array;
- means for generating a probe signal having a fixed interval relationship with the reference signal;
- means for applying the probe signal to an appropriate electrode on the electrode array;
- means for determining when the probe signal matches the reference signal;

means for shifting the location where the probe signal or reference signal is applied until the two signals match; and

means for generating a frequency map that uses the location at which the probe signal is applied and the location at which the reference signal is applied when the two signals match; and

means for using the frequency map to apply stimulus signals to correct locations within a cochlea as a function of pitch.

22. The cochlear implant system of Claim 21 wherein the means for shifting the location where the probe signal or reference signal is applied comprises current steering means for steering the location where a stimulus is applied to any location along the electrode array.

23. The cochlear implant system of Claim 21 wherein the means for generating a probe signal comprises means for generating a probe signal that has an octave relationship with the reference signal.

24. The cochlear implant system of Claim 23 wherein the means for determining when the probe signal matches the reference signal comprises means for recognizing when the probe signal is in tune with the reference signal.

25. The cochlear implant system of Claim 21 wherein the means for generating a probe signal comprises means for generating a probe signal that has a known tonal relationship with the reference signal.

26. The cochlear implant system of Claim 21 wherein the means for generating a probe signal comprises means for generating a probe signal that has a known speech sound relationship with the reference signal.